

1123-57-68

Eric J Rawdon* (ejrawdon@stthomas.edu), University of St. Thomas, 2115 Summit Ave, OSS 201, Saint Paul, MN 55105. *Supercoiling can help type II topoisomerases to unknot and unlink DNA.*

Type II topoisomerases have been shown to be 10 to 100 times more effective than random crossing changes in unknotting and unlinking DNA. The exact mechanism for such efficiency is a problem of modern curiosity. Buck and Zechiedrich proposed that type II topoisomerases might perform strand passage preferably at hooked juxtapositions. Simulations have shown that strand passage at such hooked juxtapositions on random knot configurations do preferably simplify knotting. Furthermore, Witz et al. showed that supercoiling induces a tightening of the knotted regions during simulations. In our work, we show how supercoiling creates special geometrical attributes in simulated knotted and linked DNA that could be identified by topoisomerases. This is joint work with Julien Dorier, Dusan Racko, Kenneth Millett, and Andrzej Stasiak. (Received August 15, 2016)